WOODCOCK STATUS REPORT

1974

UNITED STATES DEPARTMENT OF INTERIOR
FISH AND WILDLIFE SERVICE
Special Scientific Report—Wildlife No. 189

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Joseph W. Artmann
Office of Migratory Bird Management

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Washington, D.C. · 1975

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ABSTRACT

The estimated continental woodcock harvest exceeded 1.5 million birds during the 1973-74 hunting season. Wing-collection data for 1973-74 indicated that productivity increased during the previous spring by 15% rangewide, 9% in the Atlantic Region, and 21% in the Central Region. Daily and seasonal hunting success was also greater by 8.7% and 10.0%, respectively. The 1974 breeding population index increased 6.5% rangewide, 2.4% in the Atlantic Region, and 10.0% in the Central Region. Indices from 1964-74 suggested a declining breeding population in the Atlantic Region and an essentially stable population in the Central Region. Recoveries of 2,950 banded woodcock indicate the existence of two relatively distinct populations. More than 94% of the recoveries were made in the Region of banding.

INTRODUCTION

During the past decade, the American woodcock has become an increasingly popular game bird over much of its range. The species still ranks well below waterfowl in terms of harvest, but the ratio of woodcock to waterfowl harvested has narrowed to 1:3, or less, in several northern States. Thus, the species has advanced from a "specialty" game bird highly regarded by a few hunters to a broader based recreational resource actively pursued by many sportsmen. Owen (1975) estimated that woodcock provide between 2.5 and 3.0 million man-days of hunting recreation annually.

Because no suitable sampling framework is available in the United States for conducting a randomized woodcock harvest survey, the magnitude of the harvest has been estimated from data derived primarily from the waterfowl hunter questionnaire of the U.S. Fish and Wildlife Service (Clark 1972). The estimated 1.4 million woodcock harvested during the 1973-74 hunting season represent an increase of approximately 70% from the average of the 1964-65 and 1965-66 seasons (Table 1). This is a crude estimate, but it provides some insight into the utilization of the resource. Although over half the harvest occurs in the northern zone (Fig. 1), mid-, and southern zone harvests appear to be increasing.

In Canada, all migratory game bird hunters are required to obtain Federal permits. Thus, in recent years woodcock harvests there have been measured more precisely than in the United States. The 1967-73 Canadian woodcock harvests have averaged about 105,000 annually. Canadian harvest sampling procedures were changed in 1972, and the resulting harvest estimates are generally lower but they are believed to be more accurate. In 1973, 109,000 woodcock were harvested (Dobell 1974). Combining the Canadian and U.S. harvest estimates indicated the continental woodcock harvest exceeded 1.5 million birds in 1973. Relatively little woodcock research has been accomplished and much needs to be learned of the species' potential for meeting further recreational demands.

Two annual surveys presently provide the basis for establishing woodcock hunting regulations in the United States: (1) a wing-collection survey provides data on relative reproductive success during the previous breeding season, hunting success, changes in size and distribution of the harvest by participating hunters; and (2) a singing-ground survey provides an index to the breeding population.

Data collection and analysis have steadily improved in both surveys. Although imperfect, these two surveys produce the best rangewide information currently available for managing woodcock. This report presents data from the 1973-74 wing-collection survey, the 1974 singing-ground survey, and additional information accumulated since publication of the 1973 Status Report (Clark 1974).

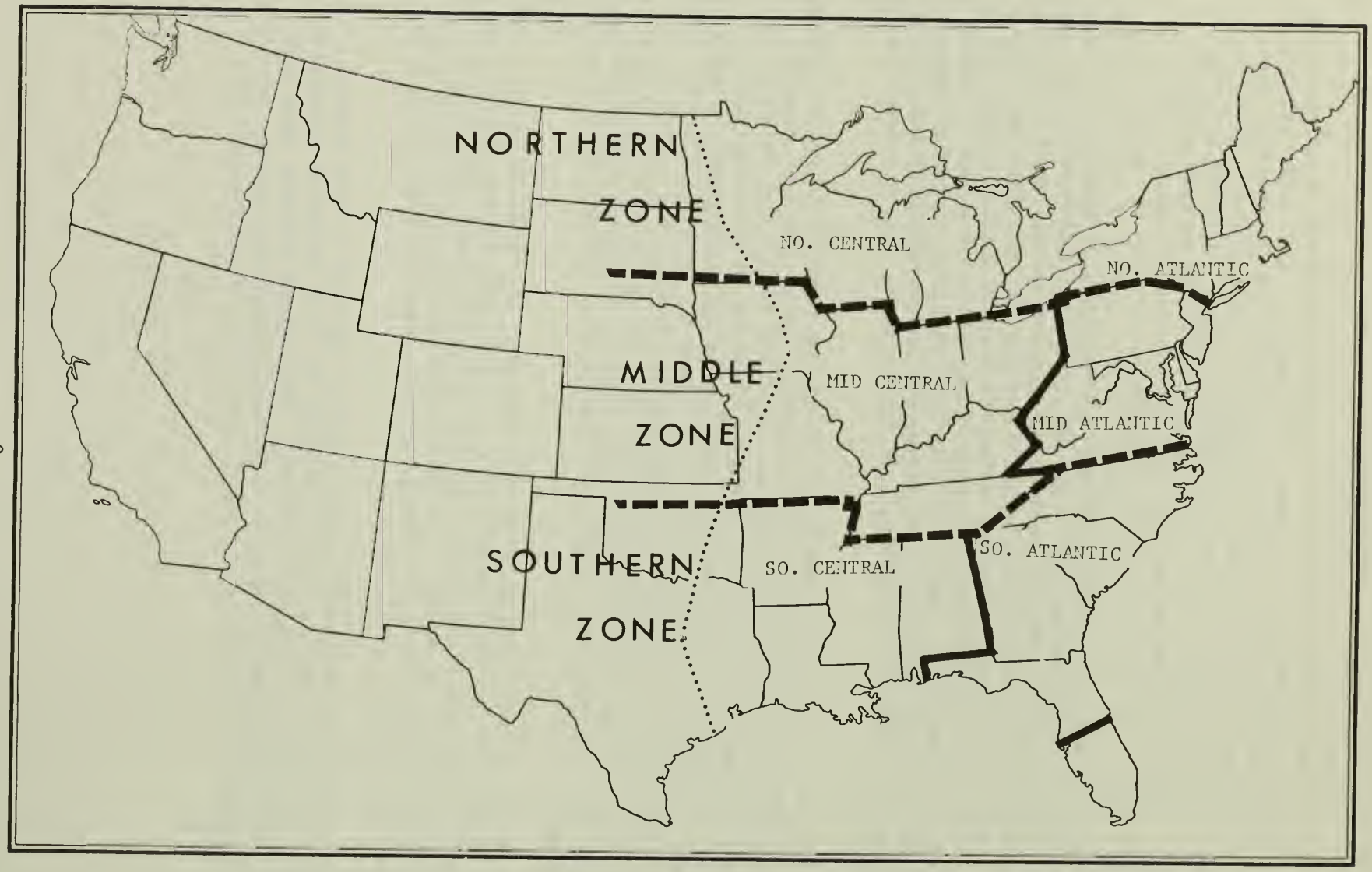

Fig. 1. Reference areas of U.S. woodcock surveys. Area to the right of the dotted line is principal woodcock range.

WING-COLLECTION SURVEY

The primary objective of the wing-collection survey is to determine woodcock reproductive success the previous spring as reflected by the age and sex composition of the harvest sample. The survey also produces information on changes in the temporal distribution of the harvest and daily and seasonal hunter success. Response by hunters to the wing-collection survey has been excellent since its inception in 1959, varying from 8,786 wings that year to 23,112 for the 1973-74 season and averaging about 15,000 annually.

Procedures

Procedures for collecting, processing, and analyzing survey data were described by Clark (1970, 1973). Survey participants are assembled from a variety of sources, including those hunters who cooperated in the survey the previous year, respondents who indicated on the U.S. Fish and Wildlife Service's waterfowl questionnaire and State harvest surveys that they hunted woodcock, and requests by individuals that they or their friends be included in the survey. Clark (1970) discussed biases associated with assembling a survey sample from these sources, but speculated that major changes in productivity and harvest rates could be detected. When only data from comparable hunters are used, presumably some of this bias is reduced.

Because the number of wings received from each State may not be proportional to the woodcock harvest of that State, data used to compute overall productivity and harvest index trends must be weighted. No one has devised a completely satisfactory weighting method because of the lack of a uniform sampling framework. Current weighting procedures are based upon a combination of data from the Service's waterfowl questionnaire survey, duck stamp sales, and State license sales (Clark 1970). Wing totals vary between different tables in this report because incomplete information necessitated exclusion of a few wings from some tabulations. A linear regression model was used to determine long-term trends.

Results

Although 1% fewer hunters were contacted in the 1973-74 woodcock wing-collection survey, 8% more responded. They contributed 23,112 wings, which is 21% more than in 1972-73. Distribution of hunter contacts by States and contact codes revealed that the response rate was better in northern States than in southern States and averaged 29% overall (Table 2). To improve the distribution of the wing sample, more hunters in midlatitude and southern States have been contacted in recent years (Table 3). Generally adequate samples are available from northern States.

A State-by-State comparison of the number of cooperators, envelopes returned, and wings received for the past two hunting seasons is shown in Table 4. Data on average number of wings per envelope and number of envelopes received during 1973-74 are not strictly comparable because data from

previous years did not include envelopes in which no wings were submitted. These envelopes represented hunts during which no woodcock were bagged. Hence the decrease in the number of wings per envelope may have been partially caused by procedural methods.

Age and sex data from 1963-64 through 1973-74 wing collections show about an equal proportion of adults (48.4%) and immatures (51.6%) in the harvest (Table 5). The immatures were almost equally divided between males and females (50.7% vs. 49.3%), while among adults there was a greater proportion of females (59.9%) than males (40.1%). The latter difference was statistically significant ($P<0.01$, $t = 3.99$). It is not known if this difference is real or caused by the method of data collection. If differential hunting mortality is occurring, then it could affect age ratios in the harvest sample. Data for woodcock banded in Maine indicate that survival rates for adult males and females, and immature females were similar while those for immature males were significantly lower (Krohn et al. 1974). Hence, immature male mortality apparently occurs between the time the harvest is sampled and males are banded as adults. Further study is needed to determine where and when mortality occurs. Does it occur on the wintering or breeding areas or during migration? Is it a result of weather conditions, predation, or other factors?

Productivity Index

Because woodcock can be aged and sexed by wing plumage characters (Martin 1964), the ratio of immatures per adult female in the wing survey provides a measure of reproductive success during the preceding breeding season (Table 6). Considerable variation in age ratios occurs among different harvest areas (States or Provinces) and between years for the same harvest areas. These variations are probably caused by differences in hunting season dates, weather conditions, hunting restrictions, and possibly a combination of differential migration and hunting vulnerability.

Some variation has been eliminated by computing the weighted productivity index with only data from hunters who participated in the survey for 2 consecutive years. Before the 1970-71 season, annual changes in age ratios were small when range-wide data were weighted and combined (Fig. 2). Large fluctuations occurred in 1970-71 (25% increase) and in 1971-72 (26% decrease). The cause of these unusual fluctuations has not been determined but adverse weather shortly after hatching may be a factor (Clark 1974). The 1973-74 index showed a 15% increase over 1972-73 (Table 7). However, the linear regression model does not show any significant long-term trend in productivity ($r = -.46$).

Separating rangewide productivity data into regional components also failed to show statistically significant long-term trends (Fig. 3). The weighted productivity ratio for the Atlantic Region increased 9% over 1972-73 while that for the Central Region increased 21%. In the Atlantic Region, the ratio has varied widely, especially since the 1969-70 season. Before 1972-73,

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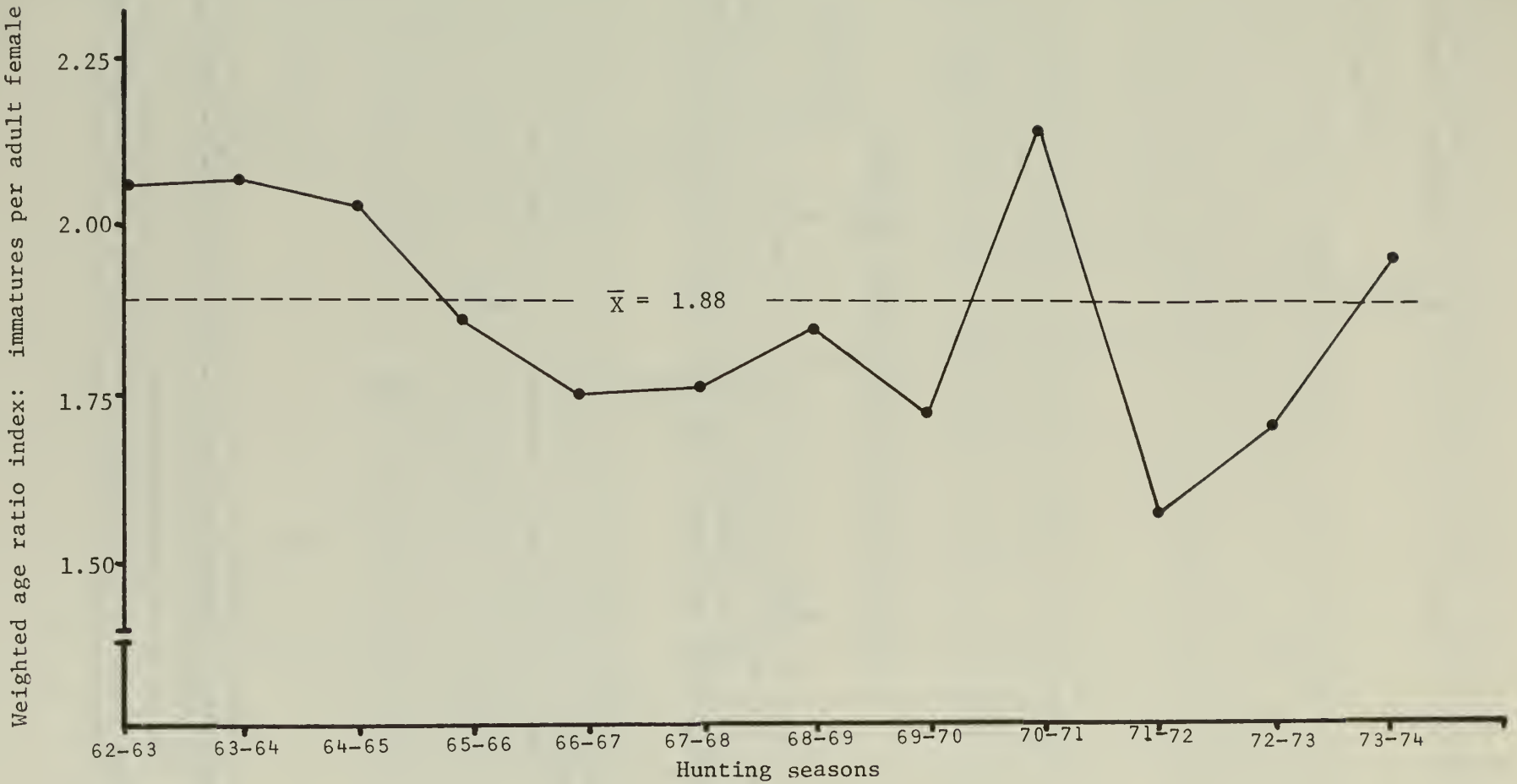

Fig. 2. Weighted rangewide trends in age ratio index, as determined from woodcock wing-collection survey data from comparable hunters (Base Year - 1969-70).

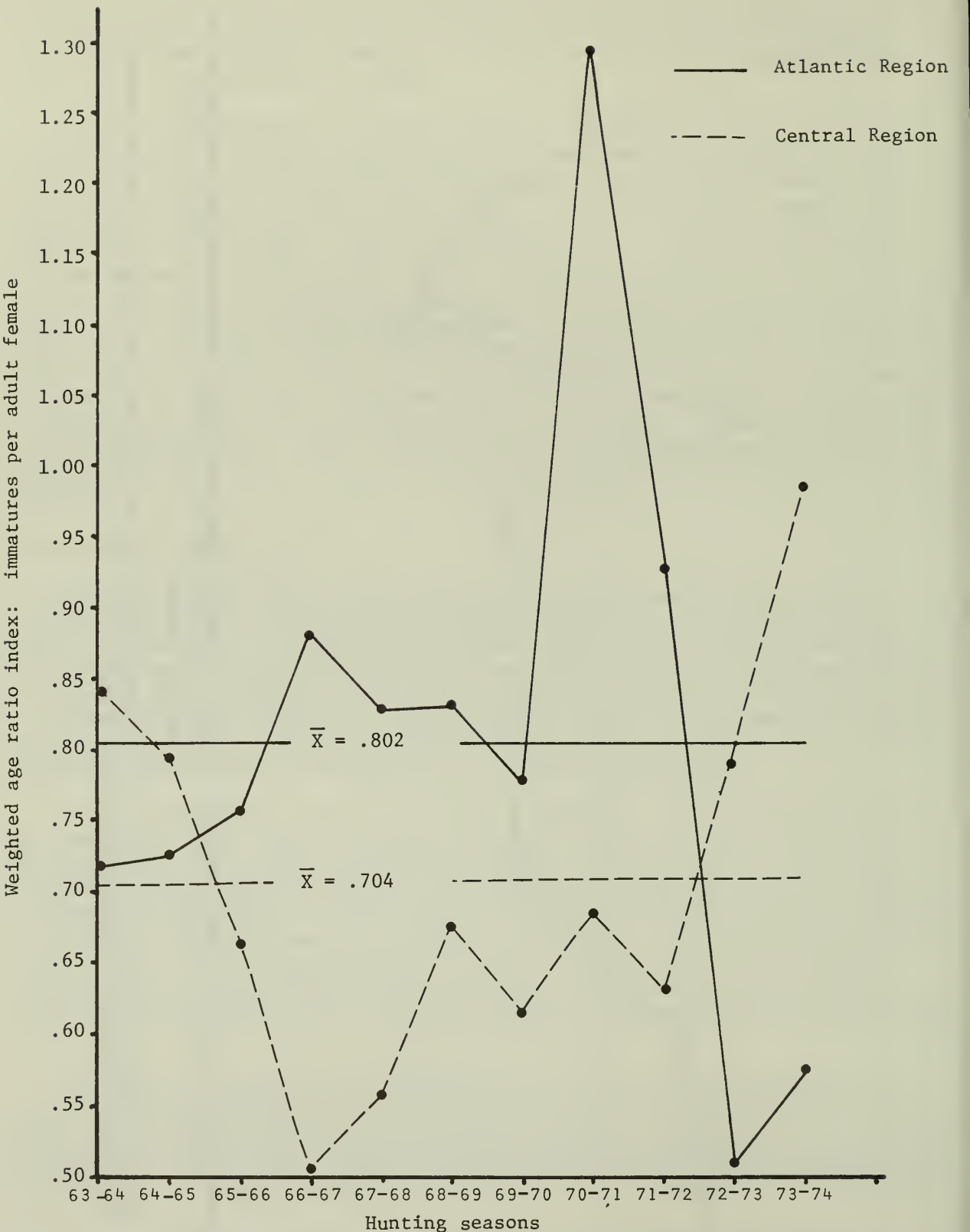

Fig. 3. Regional trends in weighted age ratio indices, as determined by woodcock wing-collection survey data from comparable hunters (Base Year - 1969-70).

the ratio of immatures per adult female was generally higher in the Atlantic Region. Fluctuations in the Central Region have been less extreme, with a general decline from 1963-64 to 1966-67 and an increase thereafter.

Hunter Success Index

Based on data from comparable hunters, daily and seasonal hunting success, as indicated by average number of wings per envelope and per cooperator, increased by 8.7% and 10.0%, respectively (Table 8). Daily and seasonal success for the past 11 years are plotted on Fig. 4. The curves appear similar but a linear regression analysis indicated a significant decline ($r = 0.72$, $P<0.01$) in daily hunting success but not for seasonal hunting success. Common data were used to calculate both success indices; consequently the results should be viewed cautiously.

Daily hunting success is also indicated by the daily bag size distribution. Daily bag size data for the 1973-74 season and the average daily bag size from 1969 through 1974 are presented in Table 9. The 1973-74 season was more successful because a larger percentage of hunters attained the daily bag limit than in previous years. Conversely, fewer bags contained only one woodcock.

Regional Analysis of Wing-Collection Data

Sex and Age Ratios

An investigation of factors affecting productivity and hunter success was initiated in 1970. Since differential migration by sex and age groups in conjunction with the timing of hunting seasons would materially influence the productivity index, the first step was to analyze regional sex and age ratios by time periods.

Wing-collection data were divided into 10-day segments for regional comparisons. These segments were subsequently grouped into three major periods so that approximately 50% of the wings were in the middle period and 25% each in the first and last periods. If seasonal trends in sex or age ratios occurred, this broad separation between the early and late seasons should make them more apparent. Because weather probably influences the timing of migration and the availability of woodcock, yearly weather variations make the interpretation of the results difficult. Data for the 1969-70 through 1973-74 seasons are summarized for the Atlantic and Central Regions (Tables 10 and 11). Differences have been noted, but the results are not yet conclusive.

Chronology of Harvest

With a season length of 65 days States can generally select a season encompassing the period of greatest woodcock abundance. A few States, however, continue to set woodcock hunting seasons with resident game species in mind. This reduces woodcock hunting opportunity because the period of greatest woodcock abundance may be missed in many years.

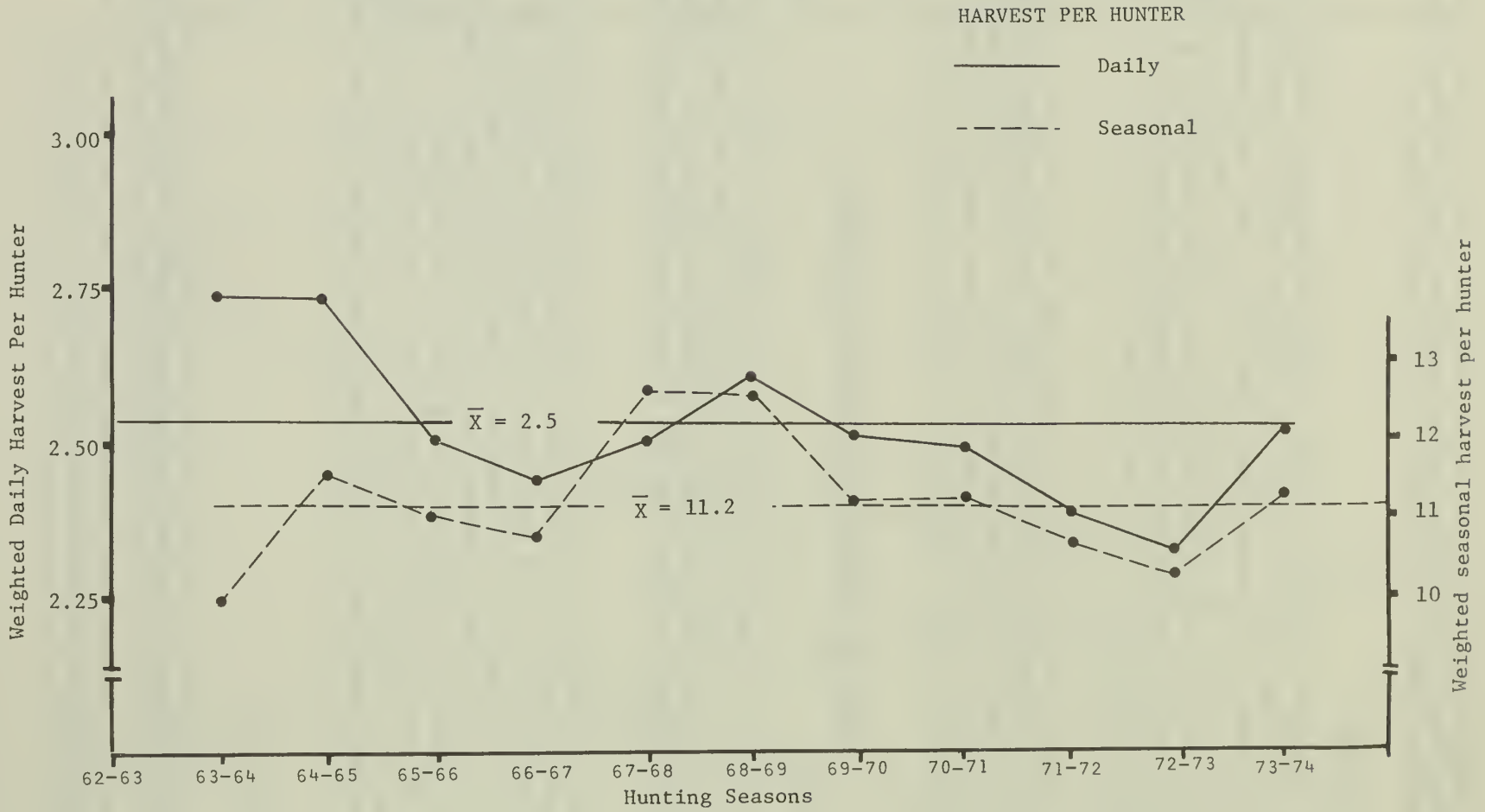

Fig. 4. Weighted daily and seasonal harvest per hunter indices, as determined from annual woodcock wing-collection survey data from comparable hunters (Base Year - 1969-70).

Distributions of the 1971-72 through 1973-74 harvests by 10-day periods are shown for the Atlantic and Central Regions (Tables 12 and 13). Because no adjustment was made for periods encompassing less than 10 hunting days, these data only approximate migrational chronology. Such periods may occur at the beginning or end of the hunting season, but heavier hunting pressure on opening day or first weekend may partially compensate for the shortened period. However, the typical concentration of hunting effort and harvest in the beginning of the season probably is not as great for woodcock as for other species.

Wing-collection data from 1970 through 1973 were also summarized by 7-day periods beginning with the opening date in each State (Tables 14 and 15). The shorter period provides better information on the chronology of harvests but makes regional pooling of data more difficult because it accentuates State-to-State variations in opening dates. In contrast, it eliminates variation associated with 10-day periods, where the first period may contain from 1 to 10 days and one or two weekends. The effect of weekend hunting varies depending if Sunday hunting is permitted.

The combined data suggest that some States could benefit from earlier or later seasons than those selected in recent years. Although results may be biased by inadequate sample sizes in some States, a high percentage of the total harvest in the first 2 weeks suggests that an earlier season might be desirable. In contrast, concentration of the harvest toward the end of the season suggests that a later season may be appropriate. States having small survey samples may profit by examining data from States in the same general latitude.

SINGING-GROUND SURVEY

Procedures

The singing-ground survey, which involves counts of singing males heard along predetermined routes, is interpreted as an index to the size of the post-migrational breeding population. Between 1964 and 1970, the survey has gradually changed from routes located in average or better quality woodcock habitat to routes randomly distributed throughout the major breeding range (Clark 1970). Since 1970, the breeding population index has been based solely on random routes which provide better statistical reliability.

The 1974 index was derived from data collected on 908 routes comparable with those sampled the previous year (Table 16). This number of comparable routes is 13% greater than in 1973. In computing the index, data from each State were weighted according to its proportion of the total land area (inland water area excluded) in the region or in the range of the species (Table 17).

Routes on which no breeding males were heard at any of the 10 stops for 2 consecutive years under comparable circumstances are placed in the "Constant 0" group. They are included in the number of comparable routes but are not field-checked annually. At 5-year intervals they are rechecked to determine if woodcock are present.

Because the group of routes paired with comparable routes the preceding year is not necessarily the same group paired with comparable routes the subsequent year, it is illogical to depict numbers of singing birds heard per route. Conversion to random routes, which averaged fewer birds than management routes, also precludes portraying the average number of birds per route. In order to compare the results, the data were adjusted by the percentage change between years with 1970 as base year (Clark 1973). A linear regression model was used to determine trends.

Results

In 1974, the number of woodcock heard per comparable route increased by 6.5% range-wide, 2.4% in the Atlantic Region and 10.0% in the Central Region (Table 16). A summary of weighted regional and range-wide changes for the past 10 years follows:

	Percentage change from previous year		
Year	Atlantic Region	Central Region	Rangewide
1965	-0.4	-11.1	-6.5
1966	+2.4	-0.5	+1.7
1967	+1.5	-3.5	0
1968	-8.4	-4.5	-6.9
1969	+4.2	+12.1	+8.8
1970	0	+3.1	+2.1
1971	-9.8	-7.3	-8.4
1972	+1.6	+3.7	+2.7
1973	-6.3	-2.8	-4.3
1974	+2.4	+10.0	+6.5

Range-wide data are plotted in Fig. 5, but no long-term trend is apparent. However, differences appear if range-wide data are separated into regional components (Fig. 6). Overall, the Atlantic Region breeding population index (BPI) declined from 1964 to 1974. The linear regression model indicates an annual rate of decline of 2% per year ($r = -0.85$, $P<0.01$). In contrast, the Central Region's BPI declined before 1969 and since then has fluctuated around the mean. The regression analysis indicated an overall increasing BPI at an annual rate of about 0.5% per year; however, the increase was not statistically significant ($r = 0.28$).

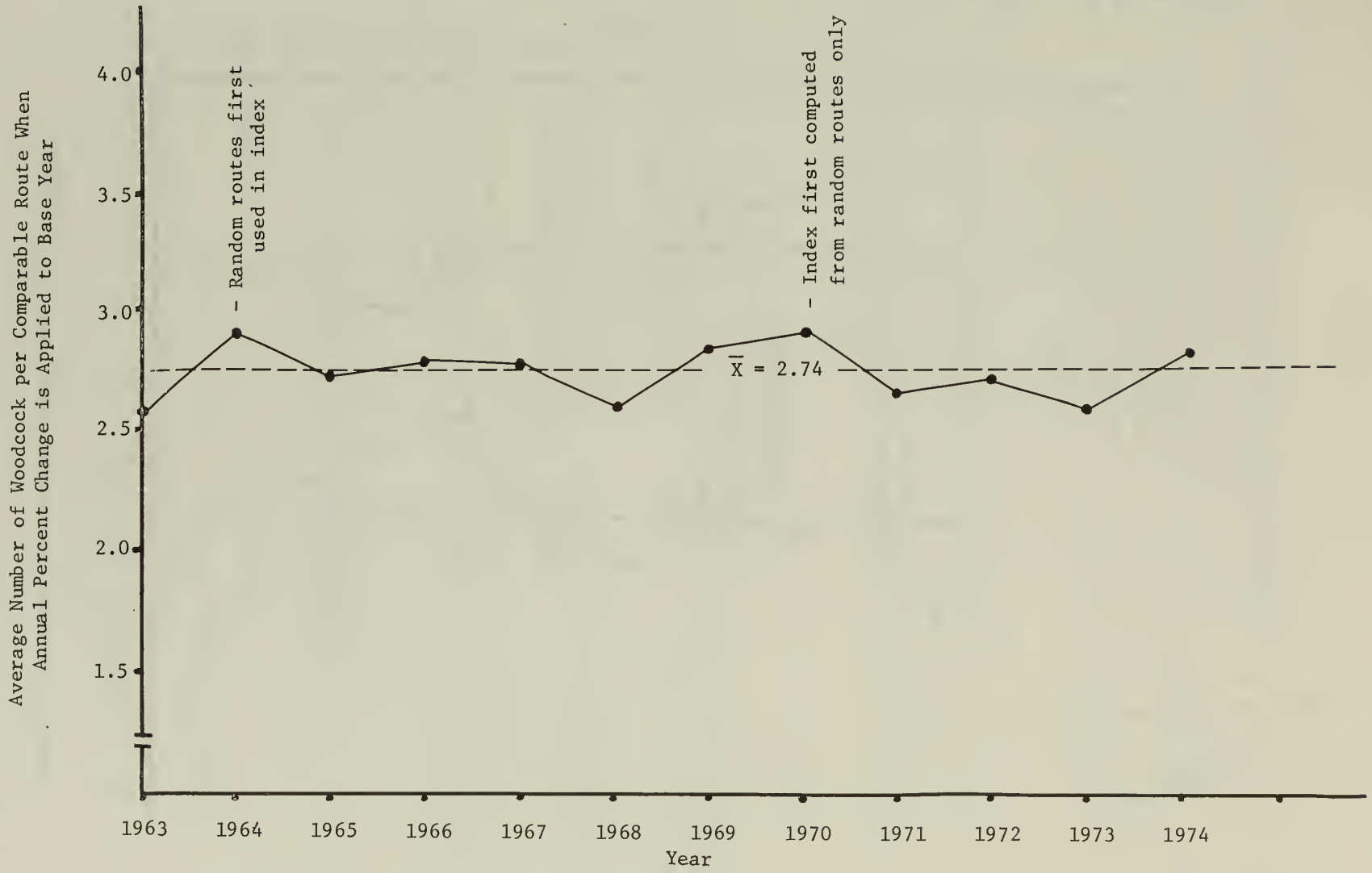

Fig. 5. Rangewide trend in singing male woodcock as determined from annual singing-ground surveys. (Base Year - 1970)

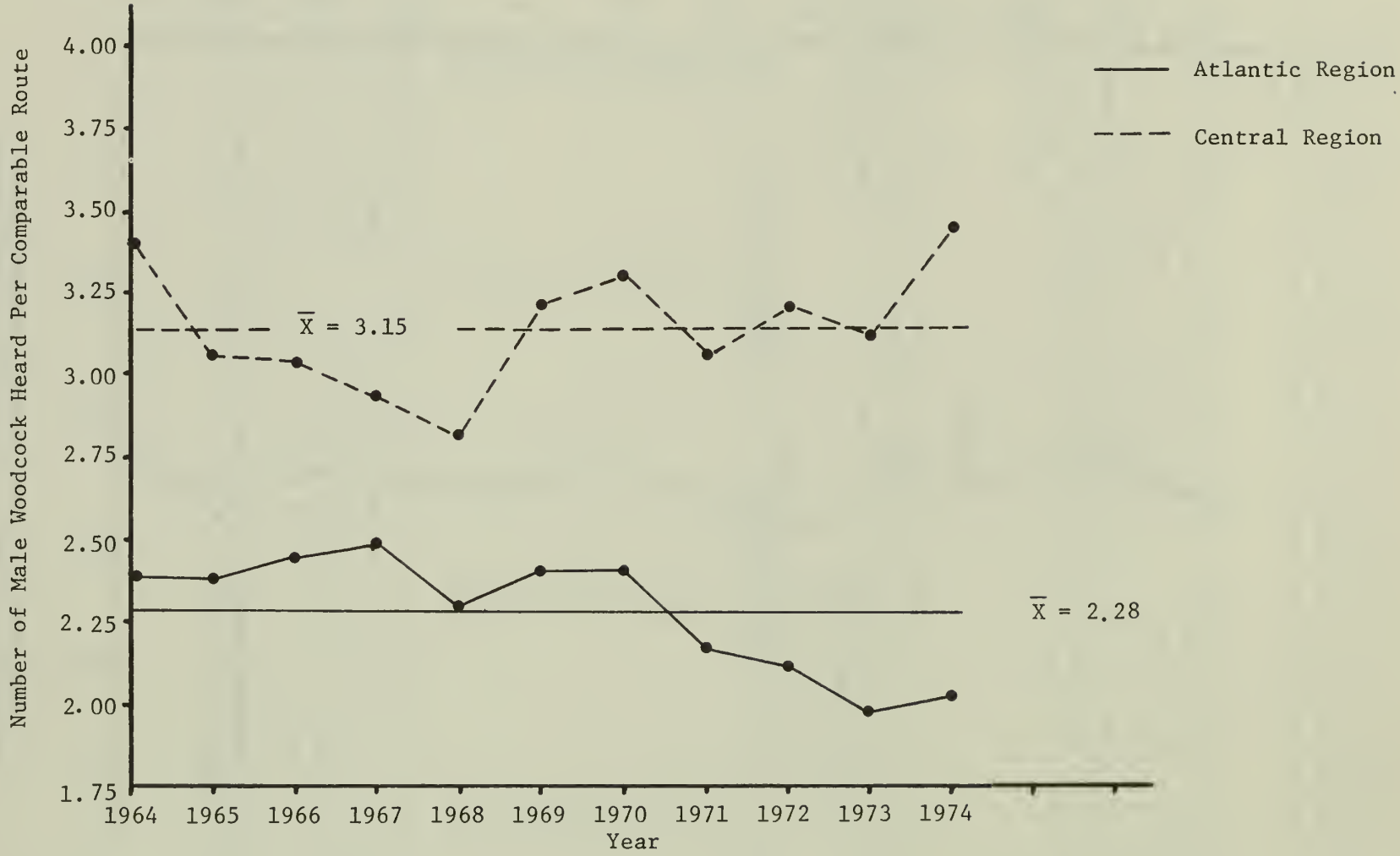

Fig. 6. Regional trends in woodcock breeding index as determined by singing-ground survey. (Base Year - 1970)

BANDING ACTIVITIES

Greater banding effort at the northern edges of main breeding areas would provide data for a better understanding of the origins of wintering and migrant populations as well as the timing of migrations. Population origin and migration data are needed to evaluate the influence of weather on reproduction and other factors of vital importance to woodcock management. Banding in southern areas would help to identify local populations, their migrational characteristics, and the impact of late hunting seasons. During 1973, 5,470 woodcock were banded, 2,947 in the Atlantic Region and 2,523 in the Central Region. Expansion of banding effort during 1961-73 is reflected in Table 18. The increase, particularly evident in preseason banding, is illustrated in Fig. 7.

Comparisons of recovery data for 2,950 banded woodcock show two relatively distinct woodcock populations (Table 19). More than 96% of the recoveries for woodcock banded in the Atlantic Region occurred in that Region. Similarly, almost 91% of the Central Region's recoveries occurred there. Most interregional recoveries were from birds banded near regional borders. The lack of substantial interchange between regions indicates that management by regional units is biologically sound.

ACKNOWLEDGMENTS

Most data in this report would not be available without the cooperation of the Canadian Wildlife Service; Provincial and State conservation departments; U.S. Fish and Wildlife Service personnel of Regions 3, 4, and 5; and the many individuals who assisted in the surveys.

Special appreciation is extended to the University of Massachusetts Press for permission to reproduce the late Mr. A. Lassell Ripley's etching "Early Woodcock" which again appears on this report's cover.

Also, special thanks are extended to the biologists who worked at the Patuxent Wildlife Research Center, Laurel, Md., processing over 23,000 woodcock wings and coding the data for computer analysis. These cooperators and their affiliations are as follows:

Joe Coggin	Virginia Commission of Game & Inland Fisheries
Patrick O. Corr	Maine Dept. of Inland Fisheries & Game
Tom Dotson	West Virginia Dept. of Natural Resources
William B. Krohn	U.S. Fish and Wildlife Service
Tim Linkkila	Connecticut Dept. of Environmental Protection
Fant Martin	U.S. Fish and Wildlife Service
Robert McKee	Maryland Dept. of Natural Resources
George O'Shea	U.S. Fish and Wildlife Service

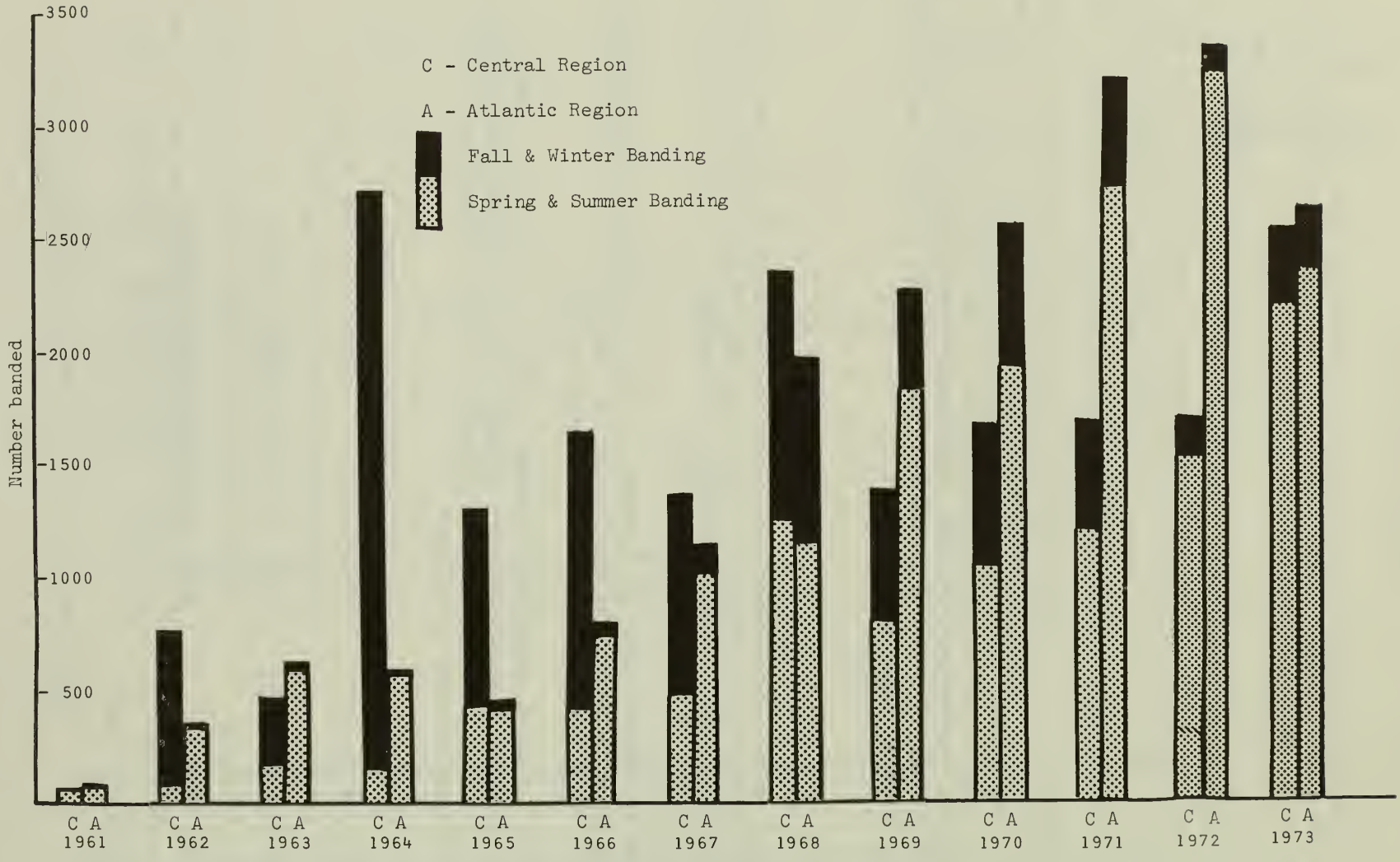

Fig. 7. Woodcock banding by regions, 1961-73 (excluding experimental birds).

Josh Sandt	Maryland Dept. of Natural Resources
James G. Sieh	U.S. Fish and Wildlife Service
W. Hassel Taylor	Virginia Commission of Game & Inland Fisheries
Mark T. Traceski	State University of New York
Jeff Wallin	Vermont Agency of Environmental Conservation
Lee Widjeskog	New Jersey Div. of Fish, Game, & Shellfisheries

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A P P E N D I X

Table 1.--Woodcock harvest data from Waterfowl Hunter Mail Survey.

REFERENCE AREA	Waterfowl hunters in woodcock hunting States		Waterfowl hunters who hunted woodcock		Woodcock harvest by waterfowl hunters	
	Number[a]	% Increase[b]	Number[a]	% Increase[b]	Number[a]	% Increase[b]
North Central	371,596	21.5	51,178	23.2	211,094	50.1
Mid-Central	236,685	48.4	16,206	79.8	41,015	46.4
South Central	351,721	42.8	22,612	75.8	129,695	84.6
REGION TOTAL	917,494	29.1	89,996	41.9	381,804	59.8
North Atlantic	178,701	70.9	55,244	80.8	200,059	66.4
Mid-Atlantic	180,046	57.5	35,383	118.3	104,357	127.1
South Atlantic	83,819	19.2	6,645	49.3	30,461	67.4
REGION TOTAL	442,566	53.0	97,272	90.0	334,877	81.6
Northern Zone	550,297	34.1	106,422	47.7	411,153	57.6
Mid-Zone	416,732	52.2	51,589	104.6	145,372	96.6
Southern Zone	435,540	37.6	29,257	69.0	160,156	81.1
U.S. TOTAL IN WOODCOCK RANGE	1,402,569	40.1	187,268	63.4	716,682	69.3

[a] Average of two latest seasons for which data are available (1972-73 and 1973-74).

[b] Increase from average of 1964-65 and 1965-66 seasons.

Table 2. Distribution of contacts and response rate in 1973-74 woodcock wing-collection survey (including Code 4 contacts added during season).

State of residence	Packets mailed by contact code[a]						Total contacted[b]	No. of cooperators	Percentage of contacts responding
	1	2	4	7	8	9			
Ala.	12	51			4	72	136	16	11
Ark.	7	32					39	4	10
Conn.	132	228	24		9		388	133	33
Del.	11	29			10		49	10	20
D.C.	1	1					2	0	0
Fla.	11	49	1		3	23	85	11	13
Ga.	27	52	1	1	13	158	242	34	14
Ill.	28	142	3		1	22	190	27	14
Ind.	31	102	1			59	191	22	12
Iowa	1	45	1				47	9	19
Kans.		22					22	1	5
Ky.	4	17				12	32	6	18
La.	45	253	7		15	293	604	62	10
Maine	162	21	4	16	55	337	588	239	41
Md.	32	88	3	2		106	231	29	13
Mass.	188	169	7		17		376	168	45
Mich.	157	111	13			503	774	197	25
Minn.	64	119	7		1		187	70	37
Miss.	20	91	1		10	79	190	21	11
Mo.	8	32	1	1		83	120	13	11
N.H.	62	160	4	1		37	259	71	27
N.J.	151	124	10	19	44	167	504	217	43
N.Y.	175	233	18		26		448	206	46
N.C.	32	70	4		3		108	31	29
Ohio	95	156	5			2	254	73	29
Okla.	4	17				5	25	2	8
Pa.	133	376	5				507	158	31
R.I.	20	32	2	11	12	125	186	45	24
S.C.	27	57	1		6	16	105	25	24
Tenn.	8	39	1	3		85	129	14	11
Tex.	8	29			3	3	43	8	18
Vt.	51	101	4			8	163	71	44
Va.	20	67	14			3	104	42	40
W. Va.	20	25	4			113	151	20	13
Wis.	131	46	16		139	349	667	271	41
TOTAL	1,878	3,186	162	54	371	2,660	8,146	2,326	29

[a]Code 1 - Previous year's Code 1, 2, 4, 7, and 8 hunters who submitted wings.
Code 2 - Waterfowl mail survey hunters who reported hunting woodcock.
Code 4 - Requested participation or proposed by fellow hunter.
Code 7 - Appeared on both Code 1 and Code 9 lists.
Code 8 - Previous year's Code 9 hunters who submitted wings.
Code 9 - From list provided by State, primarily from State kill survey.

[b]Excluding packets not deliverable.

Table 3. Changes in regional distribution of hunter contacts, 1968-69 to 1973-74.

REFERENCE AREA	1968-69	1970-71	1972-73	1973-74	6-Year percent change
North Central	1,894	1,757	1,061	1,628	-14
Mid-Central	542	721	795	985	+82
South Central	286	454	939	1,037	+263
REGION TOTAL	2,722	2,932	2,795	3,650	+34
North Atlantic	2,836	2,304	2,982	2,408	-15
Mid-Atlantic	1,424	1,764	1,872	1,548	+9
South Atlantic	264	447	616	540	+105
REGION TOTAL	4,524	4,515	5,470	4,496	-1
Northern Zone	4,730	4,061	4,043	4,036	-15
Mid-Zone	1,966	2,485	2,667	2,533	+29
Southern Zone	550	901	1,555	1,577	+187
U.S. TOTAL	7,246	7,447	8,265	8,146	+12

Table 4. Data from woodcock wing-collection surveys: 1972-73 and 1973-74 hunting seasons. Mean values for 1971-72 included for comparison.

State of residence	Number of cooperators		Number of envelopes		Number of wings		Avg. no. of wings per envelope			Avg. no. of wings per cooperator		
	72-73	73-74[a]	72-73	73-74[a]	72-73	73-74[a]	71-72	72-73	73-74[a]	71-72	72-73	73-74[a]
Ala.	16	16	42	49	59	76	1.2	1.4	1.6	3	4	5
Ark.	7	4	15	22	20	34	1.7	1.3	1.5	5	3	9
Conn.	135	133	395	479	731	872	2.1	1.9	1.8	7	5	7
Del.	16	10	18	24	20	21	2.1	1.1	.9	5	1	2
Fla.	11	11	26	26	49	40	1.1	1.9	1.5	3	4	4
Ga.	39	34	82	101	147	234	1.8	1.8	2.3	3	4	7
Ill.	23	27	72	59	150	108	2.2	2.1	1.8	6	7	4
Ind.	27	22	79	80	176	100	2.0	2.2	1.3	6	7	5
Iowa	1	9	3	23	3	39	2.0	1.0	1.7	18	3	4
Kans.	0	1	0	1	0	0	0	0	0	0	0	0
Ky.	4	6	10	16	11	27	---	1.1	1.7	--	3	5
La.	59	62	270	216	714	445	2.2	2.6	2.1	8	12	7
Maine	216	239	1,189	1,465	3,177	3,799	2.7	2.7	2.6	14	15	16
Md.	27	29	83	126	214	291	2.2	2.6	2.3	6	8	10
Mass.	190	168	748	887	1,696	1,774	2.5	2.3	2.0	11	9	11
Mich.	152	197	740	993	1,790	2,260	2.3	2.4	2.3	10	12	11
Minn.	63	70	264	366	642	914	2.5	2.4	2.5	10	10	13
Miss.	30	21	101	83	176	126	1.3	1.7	1.5	2	6	6
Mo.	9	13	18	20	45	31	2.1	2.5	1.6	4	5	2
N.H.	58	71	200	345	409	583	2.2	2.0	1.7	8	7	8
N.J.	195	217	630	1,066	1,296	2,126	2.6	2.1	2.0	12	7	10
N.Y.	194	206	816	1,063	1,790	2,217	2.4	2.2	2.1	10	9	11
N.C.	35	31	93	89	197	144	1.7	2.1	1.6	6	6	5
Ohio	78	73	238	275	560	559	2.3	2.4	2.0	7	7	8
Okla.	2	2	2	2	4	2	1.2	2.0	1.0	2	2	1
Pa.	121	158	459	565	1,035	1,109	2.3	2.3	2.0	7	8	7
R.I.	40	45	139	223	336	441	2.4	2.4	2.0	8	8	10
S.C.	32	25	86	73	141	141	1.8	1.6	1.9	6	4	6
Tenn.	10	14	14	26	17	38	1.6	1.2	1.5	4	2	3
Tex.	10	8	22	25	34	59	2.4	1.5	2.4	5	3	7
Vt.	47	71	270	492	626	1,010	2.6	2.3	2.1	16	13	14
Va.	20	42	55	126	104	202	1.6	1.9	1.6	3	5	5
W. Va.	19	20	80	102	187	236	2.5	2.3	2.3	10	10	12
Wis.	250	271	950	1,232	2,198	2,611	2.3	2.3	2.1	9	9	10
Other	---	---	---	160	224	443	---	---	2.8	--	--	--
TOTAL	2,136	2,326	8,209	10,746	18,978	23,112	2.4[b]	2.3[b]	2.1[b]	9.4[b]	8.8[b]	9.7[b]

[a]Data includes envelopes submitted from hunts where no birds were bagged.

[b]Unweighted mean excludes information from the special study areas and unknown contact codes.

Table 5. Summary of woodcock wing survey age and sex data from 1963-64 through 1973-74.[a]

Hunting season	ADULT			IMMATURE			Total
	Male	Female	M/F	Male	Female	M/F	
1963-64	2,410	3,636	.6628	3,419	3,292	1.0385	12,757
1964-65	1,965	3,030	.6485	2,785	2,650	1.0509	10,430
1965-66	2,386	3,469	.6878	2,762	2,719	1.0158	11,336
1966-67	2,550	3,633	.7018	3,338	3,094	1.0788	12,615
1967-68	3,203	4,425	.7238	3,828	3,591	1.0659	15,047
1968-69	3,418	5,024	.6803	4,667	4,429	1.0591	17,538
1969-70	3,552	4,964	.7155	4,443	4,272	1.0400	17,231
1970-71	2,961	4,644	.6375	5,069	5,023	1.0091	17,697
1971-72	3,607	5,678	.6352	4,636	4,803	0.9652	18,724
1972-73	3,617	5,639	.6414	4,780	4,400	1.0863	18,436
1973-74	4,135	6,397	.6464	5,787	6,049	0.9566	22,368
Total	33,804	50,539		45,514	44,322		174,179
$\overline{X}$	3,073	4,595	.6687	4,138	4,029	1.0270	
% of overall harvest	19.4	29.0		26.1	25.4		

[a] Unweighted data from all harvest areas (excluding wings which could not be aged or sexed).

TABLE 6. WOODCOCK PRODUCTIVITY BY HARVEST AREA AS INDICATED BY THE 1973-74 WING COLLECTION SURVEY.

STATE OR PROVINCE OF HARVEST	AGE AND SEX CATEGORIES							TOTAL WINGS RECEIVED[a]	IMMATURES PER ADULT FEMALE[b]
	ADULT			IMMATURE			UNKNOWN AGE		
	MALE	FEMALE	UNKNOWN	MALE	FEMALE	UNKNOWN			
ALA.	24	22	--	22	8	--	--	76	--
ARK.	6	11	--	10	7	--	--	34	--
CONN.	126	163	6	270	180	6	12	763	2.80
DEL.	--	2	--	7	5	--	--	14	--
FLA.	3	8	--	15	14	--	--	40	--
GA.	59	67	--	53	43	--	2	224	1.43
ILL.	3	8	--	6	8	--	--	25	--
IND.	8	13	--	15	12	--	--	48	--
IOWA	4	2	--	3	4	--	--	13	--
KY.	5	9	1	7	5	--	--	27	--
LA.	63	111	--	133	143	2	2	454	2.50
MAINE	879	1,436	23	1,046	1,000	18	33	4,435	1.44
MD.	36	63	--	63	48	2	1	213	1.79
MASS.	181	305	2	305	311	2	6	1,112	2.03
MICH.	402	624	7	658	867	14	40	2,612	2.47
MINN.	106	181	5	237	237	--	6	772	2.62
MISS.	31	40	--	30	38	1	2	142	1.73
MO.	3	7	--	6	11	--	--	27	--
N.B.	38	44	--	62	53	1	--	198	2.64
N.H.	195	261	2	219	257	4	3	941	1.84
N.J.	280	417	5	423	450	16	40	1,631	2.13
N.Y.	519	748	8	620	695	9	23	2,622	1.77
N.C.	18	32	--	39	31	2	4	126	2.25
OHIO	60	105		103	111	1	1	385	2.05
OKLA.	--	--	--	--	2	--	--	2	--
PA.	235	355	6	267	285	7	16	1,171	1.57
QUEBEC	4	4	--	6	4	--	--	18	--
R.I.	22	48	--	48	57	1	4	180	2.21
S.C.	46	40	1	36	35	1	5	164	1.80
TENN.	17	8	--	8	2	--	3	38	--
TEXAS	11	18	--	16	14	--	--	59	--
VT.	193	292	11	265	242	5	36	1,044	1.75
VA.	27	60	--	47	42	1	1	178	1.50
W. VA.	43	51	1	62	99	1	--	257	3.18
WIS.	488	842	11	680	729	10	13	2,773	1.69
TOTAL	4,135	6,397	93	5,787	6,049	104	253	22,818	1.87

[a] EXCLUDING WINGS FROM SPECIAL STUDY AREAS.
[b] UNWEIGHTED DATA FROM HARVEST AREAS REPRESENTED BY AT LEAST 100 WINGS.

TABLE 7. INDICES OF WOODCOCK PRODUCTIVITY AS INDICATED BY AGE RATIOS DETERMINED FROM WINGS RECEIVED FROM COOPERATORS WHO PARTICIPATED IN BOTH 1972-73 AND 1973-74 SURVEYS.

STATE OF HARVEST	PROPORTION OF TOTAL KILL (WEIGHTING FACTOR)	NUMBER OF WINGS RECEIVED		ADULT FEMALES		IMMATURES		IMMATURES PER ADULT FEMALE[a]	
		1972-73	1973-74	1972-73	1973-74	1972-73	1973-74	1972-73	1973-74
ALA.		25	19	--	--	14	9	--	--
ARK.		5	28	--	--	3	12	--	--
CONN.[b]	.0217	475	600	123	135	276	349	2.24	2.59
DEL.		6	13	--	--	4	11	--	--
FLA.		12	29	--	--	8	24	--	--
GA.		58	72	--	--	31	30	--	--
ILL.		21	19	--	--	10	10	--	--
IND.		43	33	--	--	25	16	--	--
KY.		7	9	--	--	4	3	--	--
LA.[b]	.0732	463	308	81	70	320	197	3.95	2.81
MAINE[b]	.1033	3,267	3,572	944	1,160	1,555	1,668	1.65	1.44
MD.		95	187	22	55	50	101	2.27	1.84
MASS.[b]	.0342	705	895	234	254	314	492	1.34	1.94
MICH.[b]	.1898	1,811	2,079	571	497	855	1,238	1.50	2.49
MINN.[b]	.0139	450	669	139	159	223	407	1.60	2.56
MISS.		139	124	42	36	69	60	1.64	1.67
MO.		17	14	--	--	5	8	--	--
N.B.		144	152	46	28	75	93	1.63	3.32
N.H.[b]	.0294	592	649	228	175	235	318	1.03	1.82
N.J.[b]	.0412	687	1,253	150	335	428	671	2.85	2.00
N.Y.[b]	.1226	1,713	2,184	572	620	794	1,098	1.39	1.77
N.C.		117	97	28	25	67	55	2.39	2.20
OHIO[b]	.0508	298	205	101	57	126	120	1.25	2.11
PA.[b]	.2003	872	949	276	291	411	455	1.49	1.56
R.I.		79	154	13	40	44	91	3.38	2.28
S.C.		104	105	34	24	54	48	1.59	2.00
TENN.		3	8	--	--	2	2	--	--
TEXAS		15	52	--	--	3	26	--	--
VT.[b]	.0368	660	800	218	202	266	401	1.22	1.99
VA.		62	73	--	--	43	45	--	--
W. VA.		141	187	29	40	73	111	2.52	2.78
WIS.[b]	.0822	2,083	2,401	657	735	1,028	1,221	1.56	1.66
TOTAL AND WEIGHTED AGE RATIO[b]		15,169	17,939	4,575	5,043	7,415	9,390	1.71	1.97
CHANGE IN WEIGHTED AGE RATIO									15.20

[a]COMPUTED ONLY FOR HARVEST AREAS (STATES) REPRESENTED BY AT LEAST 150 WINGS IN THE 2 YEARS.
[b]WEIGHTED AGE RATIOS FOR THE SUM OF THE PRODUCTS OF STATE AGE RATIOS X THEIR WEIGHTING FACTORS.

TABLE 8. INDICES OF WOODCOCK HUNTING SUCCESS AS INDICATED BY NUMBER OF WINGS RECEIVED FROM COOPERATORS WHO PARTICIPATED IN BOTH 1972-73 AND 1973-74 WING-COLLECTION SURVEYS.

STATE OF RESIDENCE	WEIGHT FACTOR	NUMBER WHO COOPERATED BOTH YEARS	NUMBER OF ENVELOPES		NUMBER OF WINGS		AVG. NO. WINGS PER ENVELOPE		AVG. NO. WINGS PER COOPERATOR[a]	
			1972-73	1973-74	1972-73	1973-74	1972-73	1973-74	1972-73	1973-74
ALA.		7	19	17	25	19	1.3	1.1	--	--
ARK.		2	5	17	5	28	1.0	1.6	--	--
CONN.[b]	.0217	71	239	242	451	548	1.9	2.3	6.4	7.7
DEL.		4	5	9	5	12	1.0	1.3	--	--
FLA.		3	7	17	12	29	1.7	1.7	--	--
GA.		11	29	34	58	67	2.0	2.0	5.3	6.1
ILL.		4	11	9	21	19	1.9	2.1	--	--
IND.		6	19	20	43	31	2.3	1.6	--	--
KY.		2	7	5	7	9	1.0	1.8	--	--
LA.[b]	.0732	25	162	119	433	304	2.7	2.6	17.3	12.2
MAINE[b]	.1033	147	1006	1043	2763	3045	2.7	2.9	18.8	20.7
MD.		12	41	60	90	169	2.2	2.8	7.5	14.1
MASS.[b]	.0342	87	337	388	628	796	1.9	2.1	7.2	9.1
MICH.[b]	.1898	115	647	702	1595	1845	2.5	2.6	13.9	16.0
MINN.[b]	.0139	38	197	242	441	655	2.2	2.7	11.6	17.2
MISS.		14	67	62	116	117	1.7	1.9	8.3	8.4
MO.		4	7	5	17	14	2.4	2.8	--	--
N.H.[b]	.0294	31	136	159	274	301	2.0	1.9	8.8	9.7
N.J.[b]	.0412	114	357	478	664	1123	1.9	2.3	5.8	9.9
N.Y.[b]	.1226	136	660	759	1400	1826	2.1	2.4	10.3	13.4
N.C.		16	57	54	117	97	2.1	1.8	7.3	6.1
OHIO[b]	.0508	31	127	100	292	190	2.3	1.9	9.4	6.1
PA.[b]	.2003	83	328	326	754	802	2.3	2.5	9.1	9.7
R.I.		13	41	77	72	148	1.8	1.9	5.5	11.4
S.C.		13	55	49	92	97	1.7	2.0	7.1	7.5
TENN.		1	3	3	3	3	1.0	1.0	--	--
TEXAS		6	8	19	15	52	1.9	2.7	--	--
VT.[b]	.0368	34	241	285	575	702	2.4	2.5	16.9	20.6
VA.		11	30	33	61	68	2.0	2.1	5.5	6.2
W. VA.		10	47	63	109	166	2.3	2.6	10.9	16.6
WIS.[b]	.0822	172	789	869	1894	2175	2.4	2.5	11.0	12.6
TOTAL AND WEIGHTED AVERAGE[b]		1,223	5,684	6,265	13,032	15,457	2.3	2.5	12.0	13.2

[a] COMPUTED ONLY FOR STATES REPRESENTED BY AT LEAST 10 HUNTERS WHO COOPERATED BOTH YEARS.
[b] WEIGHTED AVERAGE IS THE SUM OF THE PRODUCTS OF STATE AVERAGES MULTIPLIED BY THEIR WEIGHTING FACTORS USING ONLY STATES REPRESENTED BY AT LEAST 15 HUNTERS WHO COOPERATED BOTH YEARS.

TABLE 9.--DISTRIBUTION OF DAILY BAG SIZES IN WOODCOCK WING COLLECTION BY HARVEST AREAS, 1973-74 AND 1969-70 THRU 1973-74 SEASONS.

HARVEST AREA	YEAR	BAG SIZE 1		2		3		4		5		TOTAL SUCCESSFUL HUNTS
		NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	
NO. CENTRAL	1973-74	876	36.1	534	22.0	364	15.0	225	9.3	427	17.6	2,426
	1969-74	746	42.1	394	21.9	282	15.7	144	7.8	232	12.2	1,798
MID-CENTRAL	1973-74	147	53.8	53	19.4	28	10.3	10	3.7	35	12.8	273
	1969-74	142	51.3	61	22.3	36	13.2	13	4.6	24	8.5	276
SO. CENTRAL	1973-74	169	46.8	84	23.3	43	11.9	29	8.0	36	10.0	361
	1969-74	148	48.1	64	20.4	43	13.9	19	6.3	33	11.1	307
CENTRAL TOTAL	1973-74	1,192	39.0	671	21.9	435	14.2	264	8.6	498	16.3	3,060
	1969-74	1,036	43.8	520	21.8	361	15.2	176	7.3	289	11.8	2,382
NO. ATLANTIC	1973-74	1,617	36.3	968	21.7	683	15.3	501	11.2	690	15.5	4,459
	1969-74	1,440	39.4	871	23.7	592	16.1	348	8.9	460	11.8	3,711
MID-ATLANTIC	1973-74	599	41.1	313	21.5	203	13.9	133	9.1	210	14.4	1,458
	1969-74	619	45.3	313	22.8	184	13.3	110	7.3	168	11.1	1,394
SO. ATLANTIC	1973-74	137	51.9	49	18.6	28	10.6	20	7.6	30	11.4	264
	1969-74	134	58.3	47	20.5	24	9.8	12	5.6	13	5.7	230
ATLANTIC TOTAL	1973-74	2,353	38.1	1,330	21.5	914	14.8	654	10.6	930	15.0	6,181
	1969-74	2,193	41.7	1,232	23.4	800	15.1	469	8.3	640	11.4	5,334
U.S. TOTAL	1973-74	3,545	38.4	2,001	21.7	1,349	14.6	918	9.9	1,428	15.5	9,241
	1969-74	3,228	42.4	1,751	22.9	1,162	15.1	645	8.0	929	11.5	7,715

TABLE 10. SUMMARY OF SEX AND AGE RATIOS IN WOODCOCK WING COLLECTION BY PERIODS - ATLANTIC REGION.

REGION	PERIOD	HUNTING SEASON	SAMPLE SIZE[a]	PERCENT OF SEASON SAMPLE	ADULT FEMALES/ 100 MALES	IMMATURE FEMALES/ 100 MALES	IMMATURES/ 100 ADULT FEMALES	IMM FEM/ 100 ADULT FEMALES
NORTH ATLANTIC	I (TO 10/10)	1973-74	2,644	24.4	155	114	161	86
		1969-74	2,168	23.8	162	107	151	78
	II (10/11-31)	1973-74	6,345	58.5	164	99	161	81
		1969-74	6,611	60.9	150	96	168	83
	III (AFTER 10/31)	1973-74	1,854	17.1	126	79	216	96
		1969-74	1,404	15.3	106	85	49	115
MID-ATLANTIC	I (TO 10/20)	1973-74	685	20.6	136	101	187	94
		1969-74	672	21.7	161	118	177	96
	II (10/21 - 11/20)	1973-74	2,068	62.2	162	117	177	95
		1969-74	2,500	64.1	135	104	197	100
	III (AFTER 11/20)	1973-74	570	17.2	144	90	238	113
		1969-74	445	14.2	112	90	156	62
SOUTH ATLANTIC	I (TO 12/10)	1973-74	128	24.0	117	62	180	69
		1969-74	78	18.9	126	91	49	115
	II (12/11 - 1/10)	1973-74	238	44.6	144	90	161	76
		1969-74	236	48.5	111	75	10	88
	III (AFTER 1/10)	1973-74	168	31.5	89	113	208	110
		1969-74	144	32.6	137	77	21	95

[a]EXCLUDING ADULT UNKNOWNS AND UNKNOWN SEX AND AGE.

TABLE 11. SUMMARY OF SEX AND AGE RATIOS IN WOODCOCK WING COLLECTION BY PERIODS - CENTRAL REGION.

REGION	PERIOD	HUNTING SEASON	SAMPLE SIZE[a]	PERCENT OF SEASON SAMPLE	ADULT FEMALES/ 100 MALES	IMMATURE FEMALES/ 100 MALES	IMMATURES/ 100 ADULT FEMALES	IMM FEM/ 100 ADULT FEMALES
NORTH CENTRAL	I (TO 9/30)	1973-74	1,769	29.6	172	112	264	140
		1969-74	1,162	26.0	155	99	200	100
	II (10/1-20)	1973-74	2,839	47.6	166	117	197	106
		1969-74	2,608	49.9	184	110	164	86
	III (AFTER 10/20)	1973-74	1,359	22.8	159	119	161	88
		1969-74	1,088	24.1	172	103	141	71
MID-CENTRAL	I (TO 10/10)	1973-74	128	23.6	281	235	149	104
		1969-74	158	28.6	179	139	159	89
	II (10/11 - 11/10)	1973-74	313	57.6	143	99	221	110
		1969-74	357	53.4	145	90	183	87
	III (AFTER 11/10)	1973-74	102	18.8	96	50	204	68
		1969-74	100	18.0	99	69	192	77
SOUTH CENTRAL	I (TO 12/10)	1973-74	50	6.6	100	189	217	142
		1969-74	70	10.3	110	129	22	118
	II (12/11 - 1/10)	1973-74	373	49.4	139	88	229	108
		1969-74	458	57.2	141	98	77	136
	III (AFTER 1/10)	1973-74	332	44.0	164	107	200	103
		1969-74	238	32.5	156	110	14	111

[a]EXCLUDING ADULT UNKNOWNS AND UNKNOWN SEX AND AGE.

Table 12. Distribution of 1971-72 through 1973-74 wing collections by 10-day periods[a] - Atlantic Region.
(T = less than 1.)

State	Year	Opening Date	Sample Size	Percentage of harvest in single period								Percentage of harvest in combined periods			
				1	2	3	4	5	6	7	8	1&2	3&4	5&6	7&8
Conn.	1971-72	10-16	581	11	24	27	29	7	1	1		35	56	8	1
	1972-73	10-21	609	46	35	15	4	T	--	--		81	19	T	--
	1973-74	10-20	759	6	24	37	16	13	3	T	--	30	53	16	T
Del.	1971-72	11-19	56	21	29	7	7	13	14	9	--	50	14	27	9
	1972-73	9-30	13	--	--	8	23	--	23	38	8	--	31	23	46
	1973-74	10-17	14	--	7	--	--	57	29	7	--	8	--	86	7
Fla.	1971-72	11-20	18	--	6	11	22	28	11	17	6	17	50	28	6
	1972-73	11-11	47	--	30	30	4	28	8	--		60	32	8	--
	1973-74	11-10	37	--	5	8	14	11	43	8	--	5	22	54	8
Ga.	1971-72	11-20	137	2	10	34	12	16	16	7	4	12	46	32	11
	1972-73	11-20	143	1	16	17	9	24	13	10	9	17	26	37	19
	1973-74	11-20	224	4	20	22	14	16	9	13	T	24	36	25	13
Maine	1971-72	9-24	3,750	3	26	39	28	4	T			29	67	4	T
	1972-73	9-25	3,717	1	25	45	24	4	T			26	69	4	T
	1973-74	9-24	4,423	2	25	37	27	7	2	T	T	27	64	9	T
Md.	1971-72	10-5	210	1	4	8	14	35	31	8		5	22	66	8
	1972-73	10-5	117	8	7	23	21	28	8	5		15	44	36	5
	1973-74	10-5	213	6	13	15	19	15	23	8	T	19	34	38	8
Mass.	1971-72	10-10	709	--	41	32	20	6	1			41	52	7	
	1972-73	10-10	898	13	46	26	12	2	T			59	38	2	
	1973-74	10-10	1,105	10	40	22	18	7	2	T	T	50	40	9	T
N.H.	1971-72	10-1	850	28	34	30	7	T	--	--		62	37	T	--
	1972-73	10-1	879	39	33	22	6	--	--	--		72	28	--	--
	1973-74	10-1	938	34	28	31	7	T	--	--		62	38	T	--
N.J.	1971-72	10-2	1,799	7	9	11	35	25	11	3		16	46	36	3
	1972-73	10-14	897	12	24	24	17	14	3	4	2	36	41	17	6
	1973-74	10-13	1,591	11	15	29	22	16	5	T	2	26	51	21	2

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Table 12. Distribution of 1971-72 through 1973-74 wing collections by 10-day periods[a] - Atlantic Region--continued. (T = less than 1.)

State	Year	Opening Date	Sample Size	Percentage of harvest in single period								Percentage of harvest in combined periods			
				1	2	3	4	5	6	7	8	1&2	3&4	5&6	7&8
N.Y.	1971-72	9-20	1,939	1	4	17	20	31	25	3	T	5	37	56	3
	1972-73	9-20	1,974	1	3	24	27	22	17	6	T	4	51	39	6
	1973-74	9-20	2,601	2	5	22	25	29	13	3	T	7	57	42	3
N.C.	1971-72	12-11	133	--	15	17	13	14	11	17	13	15	30	25	30
	1972-73	12-9	184	11	18	28	11	8	14	9		29	39	22	9
	1973-74	12-8	126	6	17	20	15	15	15	6	2	23	35	30	8
Pa.	1971-72	10-16	1,140	23	29	32	15	1	--	--		52	47	1	--
	1972-73	10-14	1,052	40	33	18	8	1	T	--		73	26	1	--
	1973-74	10-13	1,161	38	26	30	5	2	--	--		64	35	2	--
R.I.	1971-72	10-23	81	50	17	14	14	4	--	1		67	28	4	1
	1972-73	10-21	113	54	27	12	2	2	3	--	--	81	14	5	--
	1973-74	10-20	170	11	29	38	15	6	T	T	--	40	53	6	T
S.C.	1971-72	12-24	109	14	11	9	14	14	22	17		25	23	36	17
	1972-73	12-26	136	12	23	16	10	5	21	13		35	26	26	13
	1973-74	12-26	151	23	20	6	12	20	8	11		43	18	28	11
Vt.	1971-72	9-25	893	13	13	26	39	8	T			26	65	8	
	1972-73	9-30	676	5	30	35	23	6	T	--	--	35	58	6	--
	1973-74	9-29	1,042	9	20	35	30	6	T	--	--	29	65	6	--
Va.	1971-72	11-15	84	39	14	19	10	5	2	11		53	29	7	11
	1972-73	11-13	89	22	18	4	3	13	21	17		40	7	34	17
	1973-74	10-15	162	2	5	9	30	19	24	9	2	7	39	43	11
W. Va.	1971-72	10-16	244	16	17	40	23	3	1			33	63	4	
	1972-73	10-14	208	10	29	46	16	--	--	--		39	62	--	--
	1973-74	10-13	251	17	18	41	10	10	4	--		35	51	14	--

[a] Ten-day periods except months having 31 or 28 days or at beginning and end of hunting season.

Table 13. Distribution of 1971-72 through 1973-74 wing collections by 10-day periods[a] - Central Region. (T = less than 1.)

State	Year	Opening Date	Sample Size	Percentage of harvest in single period								Percentage of harvest in combined periods			
				1	2	3	4	5	6	7	8	1&2	3&4	5&6	7&8
Ala.	1971-72	12-24	42	14	19	16	7	12	12	21		33	23	24	21
	1972-73	12-26	50	18	14	22	12	12	20	2		32	34	32	2
	1973-74	12-26	76	9	3	46	11	9	13	9		12	57	22	9
Ark.	1971-72	12-1	21	10	10	57	10	10	--	5		20	67	10	5
	1972-73	12-1	28	--	4	21	4	21	46	4		4	25	67	4
	1973-74	12-1	34	6	18	32	3	21	12	9		24	35	32	9
Ill.	1971-72	10-15	28	4	7	11	57	21	--	--		11	68	21	--
	1972-73	10-15	37	27	24	19	27	3	--	--		51	46	3	--
	1973-74	10-15	24	29	46	13	13	--	--			75	25	--	--
Ind.	1971-72	9-25	52	--	10	21	23	11	29	6		10	44	40	6
	1972-73	9-23	98	9	13	1	13	40	23	--		22	14	63	--
	1973-74	9-22	45	20	9	27	22	20	2	--		29	49	22	--
Ky.	1971-72	11-18	0	--	--	--	--	--	--	--		--	--	--	--
	1972-73	11-16	10	60	30	10	--	--	--	--		90	10	--	--
	1973-74	10-15	27	--	--	--	22	70	7	--		--	22	77	--
La.	1971-72	11-25	307	6	11	17	26	17	11	13		17	33	28	13
	1972-73	12-9	731	7	21	29	11	18	9	5	1	28	40	27	6
	1973-74	12-8	448	6	13	21	23	19	13	6		19	44	31	6
Mich.	1971-72	9-15	2,388	14	13	23	20	24	6	T	--	27	43	30	T
	1972-73	9-15	1,996	16	16	23	25	13	5	2	--	32	48	18	2
	1973-74	9-15	2,574	13	19	23	21	18	5	1	T	32	44	23	1
Minn.	1971-72	9-4	707	6	13	7	19	24	26	4		19	26	50	4
	1972-73	9-2	542	11	12	9	19	32	17	1		33	28	49	1
	1973-74	9-1	765	10	11	14	23	27	12	3	T	21	37	39	3

Table 13. Distribution of 1971-72 through 1973-74 wing collections by 10-day periods[a] - Central Region--continued. (T = less than 1.)

State	Year	Opening Date	Sample Size	Percentage of harvest in single period								Percentage of harvest in combined periods			
				1	2	3	4	5	6	7	8	1&2	3&4	5&6	7&8
Miss.	1971-72	12-18	37	43	11	8	3	14	8	14		54	11	22	14
	1972-73	12-18	195	13	39	7	5	4	18	13		52	12	22	13
	1973-74	12-15	137	12	15	12	8	15	9	24		28	20	25	24
Mo.	1971-72	10-1	12	8	--	--	25	50	17	--		8	25	67	--
	1972-73	10-1	24	8	12	--	29	46	4	--		20	29	50	--
	1973-74	10-1	27	--	--	26	15	22	33	4		--	41	56	4
Ohio	1971-72	9-17	419	10	9	10	19	24	20	9		19	29	44	9
	1972-73	9-15	413	8	11	16	23	20	18	4		19	39	38	4
	1973-74	9-17	376	13	8	10	21	20	23	3	1	21	31	43	5
Okla.	1971-72	11-20	7	--	43	14	14	14	14	--		43	28	28	--
	1972-73	11-20	4	--	100	--	--	--	--	--	--	100	--	--	--
	1973-74	11-20	1	50	--	50	--	--	--	--	--	50	50	--	--
Tenn.	1971-72	11-6	50	20	36	32	4	6	2			56	36	8	
	1972-73	11-18	14	29	36	14	7	14				65	21	14	
	1973-74	11-22	36	17	14	22	14	31	--	--	--	31	36	--	--
Tex.	1971-72	11-20	59	--	2	12	12	19	14	37	5	2	24	33	42
	1972-73	11-18	18	--	6	17	11	44	22	--	--	6	28	66	--
	1973-74	11-17	59	--	7	10	21	34	8	14		7	31	42	14
Wis.	1971-72	9-11	1,680	7	6	24	25	34	3	2		13	49	37	2
	1972-73	9-16	2,330	6	13	22	30	21	7	1		19	52	28	1
	1973-74	9-15	2,728	8	18	23	28	17	5	T		26	51	22	T

[a] Ten-day periods except months having 31 or 28 days or at beginning and end of hunting season.

Table 14. Distribution of 1970-71 through 1973-74 wing collections by 7-day periods[a] - Atlantic Region.
(T = less than 1.)

State	Year	Opening Date	Sample Size	Percentage of harvest in single period										Percentage of harvest in combined periods		
				1	2	3	4	5	6	7	8	9	10	1&2	3-6	7-10
Conn.	1970-71	10-17	821	27	23	19	17	8	3	1	1	--	1	50	48	2
	1971-72	10-16	581	15	16	15	20	19	11	3	T	1	T	31	65	4
	1972-73	10-21	610	29	26	26	11	6	3	T	--	--	--	55	44	T
	1973-74	10-20	759	19	16	24	17	12	7	2	1	--	--	35	61	3
Del.	1970-71	11-20	32	19	12	6	--	22	16	9	6	9	--	31	44	25
	1971-72	11-19	56	27	25	5	7	2	2	12	11	9	--	52	16	32
	1972-73	9-30	13	--	--	8	23	--	15	15	31	8	--	--	46	54
	1973-74	10-17	14	--	7	50	--	14	21	7	--	--	--	7	86	7
Fla.	1970-71	11-21	31	--	10	3	10	16	29	10	13	3	6	10	58	32
	1971-72	11-20	18	--	11	6	6	28	17	11	--	17	6	11	56	33
	1972-73	11-11	47	--	11	26	23	--	6	23	9	2	--	11	55	34
	1973-74	11-10	37	--	11	3	5	11	14	24	16	5	8	14	54	31
Ga.	1970-71	11-20	106	8	5	4	11	13	20	14	7	8	10	12	48	40
	1971-72	11-20	135	12	2	32	10	13	4	13	3	7	2	14	60	26
	1972-73	11-20	143	13	10	11	4	7	22	11	5	12	4	23	45	32
	1973-74	11-20	224	12	15	20	11	7	12	5	13	3	T	27	50	23
Maine	1970-71	10-1	3,715	18	20	23	24	11	2	T	T	--		39	61	T
	1971-72	9-24	3,750	3	16	28	22	20	8	2	T			19	79	2
	1972-73	9-25	3,715	2	19	26	30	15	7	1	T			20	79	1
	1973-74	9-24	4,423	2	13	25	24	23	8	2	2	T	T	15	81	4
Md.	1970-71	10-9	176	2	7	14	18	16	9	14	8	8	4	8	56	35
	1971-72	10-5	210	2	1	4	9	7	19	30	20	7	1	3	39	58
	1972-73	10-5	115	9	2	18	8	20	12	19	7	3	3	10	58	31
	1973-74	10-5	213	7	7	10	10	15	9	17	12	9	2	13	46	40
Mass.	1970-71	10-10	753	32	24	24	10	8	1	1	T			56	43	1
	1971-72	10-10	709	32	21	21	14	8	4	1	--			52	47	1
	1972-73	10-10	898	42	28	13	11	5	1	T	--			70	30	--
	1973-74	10-10	1,100	35	23	12	13	9	5	2	T			58	39	2
N.H.	1970-71	10-1	1,185	20	16	19	19	16	9	T	T	T		37	63	T
	1971-72	10-1	850	21	18	26	18	13	4	--	T	--		38	62	T
	1972-73	10-1	879	26	28	24	14	7	2	--	--	--		53	47	--
	1973-74	10-1	938	27	19	22	21	8	2	T	--	--		46	53	T
N.J.	1970-71	10-3	1,612	9	7	17	16	13	17	9	7	4	1	17	63	21
	1971-72	10-2	1,799	4	8	5	7	21	21	18	10	6	1	12	54	34
	1972-73	10-14	897	12	16	16	15	12	12	7	2	5	2	28	56	16
	1973-74	10-13	1,591	7	10	13	19	19	16	9	5	T	T	17	66	15

Table 14. Distribution of 1970-71 through 1973-74 wing collections by 7-day periods[a] - Atlantic Region--cont.
(T = less than 1.)

State	Year	Opening Date	Sample Size	Percentage of harvest in single period										Percentage of harvest in combined periods		
				1	2	3	4	5	6	7	8	9	10	1&2	3-6	7-10
N.Y.	1970-71	9-21	2,035	3	12	11	14	22	17	13	5	2	T	15	65	20
	1971-72	9-20	1,939	4	7	10	14	15	21	22	5	1	--	11	61	28
	1972-73	9-20	1,966	3	8	17	21	15	13	14	8	1	T	11	66	23
	1973-74	9-20	2,601	5	8	16	14	24	16	12	3	2	T	13	70	17
N.C.	1970-71	12-11	209	9	13	15	14	7	7	12	15	5	2	22	44	34
	1971-72	12-11	133	8	20	4	9	8	11	5	7	20	8	28	33	39
	1972-73	12-9	185	17	16	22	10	3	8	3	8	6	3	33	42	25
	1973-74	12-8	126	10	16	16	6	12	5	19	7	4	2	27	39	33
Pa.	1970-71	10-17	1,107	32	23	25	11	5	3	1	--	--	--	56	44	1
	1971-72	10-16	1,137	27	18	26	17	8	4	T	--	--	--	45	55	T
	1972-73	10-14	1,051	40	25	13	13	7	1	T	T	--	--	65	34	T
	1973-74	10-13	1,161	32	20	20	20	5	2	T	--	--	--	51	48	T
R.I.	1970-71	10-24	65	29	15	40	3	6	5		--	--	1	45	54	1
	1971-72	10-23	81	40	15	21	6	4	10	4	--	1	--	54	41	5
	1972-73	10-21	113	36	20	25	11	3	1	2	3	--	--	57	39	4
	1973-74	10-20	167	24	18	28	16	9	5	T	T	--		42	57	T
S.C.	1970-71	12-13	66	9	17	14	11	11	17	4	4	3	11	26	52	23
	1971-72	12-24	109	9	5	7	8	9	5	15	17	20	3	15	30	55
	1972-73	12-26	127	11	17	16	5	7	6	4	17	17	1	28	33	39
	1973-74	12-26	151	25	15	5	7	8	14	8	8	8	3	40	33	27
Vt.	1970-71	9-26	609	10	22	19	18	15	14	3	--	T	--	32	65	3
	1971-72	9-25	888	13	10	11	24	26	11	4	T	--	--	23	73	4
	1972-73	9-30	675	22	22	27	18	9	3	T	--	--	--	44	56	T
	1973-74	9-29	1,042	16	17	27	23	12	5	T	---	--	--	33	67	T
Va.	1970-71	11-16	168	8	18	6	16	7	15	2	7	14	8	26	44	30
	1971-72	11-15	84	39	8	23	11	1	2	2	2	6	5	48	37	16
	1972-73	11-13	89	20	17	3	4	1	2	13	18	16	5	37	11	52
	1973-74	10-15	162	2	3	2	10	25	19	10	12	11	2	6	56	36
W. Va.	1970-71	10-10[b]	147	9	10	22	19	27	10	3	--	--		18	78	3
	1971-72	10-16	243	21	11	26	19	13	8	2	--	--	--	32	66	2
	1972-73	10-14	208	10	20	16	38	12	4	--	--	--	--	30	70	--
	1973-74	10-13	251	14	11	22	24	14	6	5	6	--	--	25	66	9

[a] First period begins on season opening date; 10th period 2 days or less.
[b] Excluding special 8-day season in September.

Table 15. Distribution of 1970-71 through 1973-74 wing collections by 7-day periods[a] - Central Region.
(T = less than 1.)

State	Year	Opening Date	Sample Size	Percentage of harvest in single period										Percentage of harvest in combined periods		
				1	2	3	4	5	6	7	8	9	10	1&2	3-6	7-10
Ala.	1970-71	12-13	51	22	2	16	24	4	4	2	20	6	2	24	47	29
	1971-72	12-24	42	12	14	10	12	5	5	10	10	19	5	26	31	43
	1972-73	12-26	49	18	12	10	12	12	8	10	14	2	--	31	43	27
	1973-74	12-26	74	8	1	26	24	8	3	8	12	7	3	9	61	30
Ark.	1970-71	12-1	56	23	14	4	7	21	5	9	--	14	2	38	38	25
	1971-72	12-1	21	10	5	29	24	19	5	5	--	--	5	14	76	10
	1972-73	12-1	28	--	4	4	11	7	4	18	25	29	--	4	25	71
	1973-74	12-1	34	6	9	18	24	3	9	12	12	9		15	53	32
Ill.	1970-71	10-1	4	--	25	--	--	--	50	--	--	--	--	25	25	50
	1971-72	10-15	28	4	7	11	--	54	4	21	--	--		11	68	21
	1972-73	10-15	37	27	24	3	30	11	3	3	--	--		51	46	3
	1973-74	10-15	24	46	25	4	8	17	--	--	--			71	29	0
Ind.	1970-71	9-19	60	33	7	3	7	8	17	12	10	2	2	40	35	25
	1971-72	9-25	52	--	8	14	10	21	8	10	12	19	--	8	52	40
	1972-73	9-23	98	9	6	7	1	7	26	20	23	--	--	15	41	44
	1973-74	9-22	45	20	4	4	13	29	7	17	4	4		24	53	23
Ky.	1970-71	11-19	4	25	75	--	--	--	--	--	--	--	--	100	--	--
	1971-72	11-18	0	--	--	--	--	--	--	--	--	--	--	--	--	--
	1972-73	11-16	10	60	30	10	--	--	--	--	--	--	--	90	10	--
	1973-74	10-15	27	--	--	--	--	--	15	52	33	--	--	--	15	85
La.	1970-71	12-9	332	4[b]	8	18	22	18	9	5	11	2	3	11	68	21
	1971-72	11-25	307	6	8	13	11	19	6	15	8	12	2	14	48	38
	1972-73	12-9	730	15	16	21	10	6	13	9	5	2	3	31	50	19
	1973-74	12-8	448	10	10	12	20	13	12	10	8	5	T	20	56	23
Mich.	1970-71	9-15	2,165	14	12	17	19	13	14	7	3	T		26	64	10
	1971-72	9-15	2,385	15	10	12	17	14	16	11	4	1		25	59	16
	1972-73	9-15	1,994	17	9	17	17	18	10	7	4	2		26	61	13
	1973-74	9-15	2,568	14	13	15	16	14	15	8	4	1	T	26	61	13
Minn.	1970-71	9-5	246	5	5	4	15	13	26	18	8	5	--	11	58	31
	1971-72	9-4	707	6	4	12	5	12	17	18	19	6	T	10	46	44
	1972-73	9-2	542	8	8	8	5	10	21	23	13	4	1	16	44	40
	1973-74	9-1	765	5	7	9	9	13	17	9	6	1	T	11	49	40

Table 15. Distribution of 1970-71 through 1973-74 wing collections by 7-day periods[a] - Central Region--cont.
(T = less than 1.)

State	Year	Opening Date	Sample Size	Percentage of harvest in single period										Percentage of harvest in combined periods		
				1	2	3	4	5	6	7	8	9	10	1&2	3-6	7-10
Miss.	1970-71	12-12	33	--	6	18	12	12	6	24	6	12	3	6	48	46
	1971-72	12-18	37	46	8	5	3	3	11	3	8	5	8	54	22	24
	1972-73	12-18	195	34	19	6	4	3	3	7	14	7	4	53	15	32
	1973-74	12-15	133	13	13	11	5	6	6	12	8	23	4	26	28	47
Mo.	1970-71	10-1	32	3	--	9	16	34	19	12	6	--	--	3	78	19
	1971-72	10-1	12	8	--	--	--	8	50	17	--	17	--	8	58	33
	1972-73	10-1	24	8	--	12	--	29	--	29	21	--	--	8	42	50
	1973-74	10-1	27	--	--	--	26	--	19	19	4	33	--	0	44	56
Ohio	1970-71	9-18	435	18	12	10	9	13	14	13	7	4	1	29	46	25
	1971-72	9-17	419	13	5	5	14	14	12	18	10	7	2	18	45	36
	1972-73	9-15	413	8	8	10	14	18	11	12	14	5	T	15	53	32
	1973-74	9-17	376	16	5	6	9	17	14	17	13	2	3	21	45	33
Okla.	1970-71	11-21	4	25	50	--	--	25	--	--	--			75	25	--
	1971-72	11-20	7	14	28	14	--	14	14	14	--			43	43	14
	1972-73	11-20	4	75	25	--	--	--	--	--	--	--	--	100	--	--
	1973-74	11-20	1	--	100	--	--	--	--	--	--	--	--	100	--	--
Tenn.	1970-71	11-26	21	76	10	5	--	5	--	--	5	--	--	86	10	5
	1971-72	11-6	50	22	26	26	14	4	4	4	--	--	--	48	48	4
	1972-73	11-18	13	54	15	--	--	--	15	--	8	--	8	69	15	15
	1973-74	11-22	35	14	9	6	14	20	3	--	--	--	34	23	43	34
Tex.	1970-71	11-21	20	5	20	10	10	--	5	20	5	--	25	25	25	50
	1971-72	11-20	59	--	8	5	10	12	8	7	20	24	5	8	36	56
	1972-73	11-18	18	--	11	11	--	11	39	28	--	--	--	11	61	28
	1973-74	11-17	59	--	7	2	8	27	24	19	2	3	8	7	61	32
Wis.	1970-71	9-12	1,480	7	7	13	18	23	15	10	6	2	T	14	68	18
	1971-72	9-11	1,680	5	4	4	12	23	19	19	12	1	1	9	58	33
	1972-73	9-16	2,328	8	5	17	17	24	13	10	5	1	T	13	71	16
	1973-74	9-15	2,729	9	8	18	18	20	15	9	3	3	1	17	70	13

[a] First period begins on season opening date; 10th period 2 days or less.

Table 16. Woodcock breeding population indices as indicated by singing-ground surveys in 1973 and 1974 (random routes only)[a]

State or Province	Number of routes conducted		Comparable routes[b]	Woodcock heard per comparable route	
	1973	1974		1973	1974
ATLANTIC REGION					
Connecticut	9	10	9	2.11	2.22
Delaware	1	2	3	0.66	0.66
Maine	50	47	46	3.83	3.72
Maryland	15	16	9	0.33	0.22
Massachusetts	16	15	17	2.41	2.17
New Brunswick	58	45	41	4.90	5.41
New Hampshire	14	14	13	3.46	4.85
New Jersey	12	12	16	2.63	2.13
New York	57	60	73	2.42	2.48
Nova Scotia	41	30	35	2.14	2.66
Pennsylvania	40	38	67	1.21	0.87
Prince Edward Island	9	8	9	2.67	3.00
Quebec	26	16	16	2.44	2.88
Rhode Island	2	2	4	1.25	0.75
Vermont	20	21	14	2.14	2.29
Virginia	31	25	70	0.31	0.47
West Virginia	20	22	47	0.87	0.70
REGIONAL TOTAL & WEIGHTED AVG.[c]	421	383	489	2.49	2.55
REGIONAL INDEX CHANGE					+2.41%
CENTRAL REGION					
Illinois	17	16	26	0.19	0.15
Indiana	22	23	45	0.33	0.29
Michigan	119	90	94	3.79	4.39
Minnesota	43	38	51	1.41	1.69
Ohio	45	47	73	0.89	0.78
Ontario	49	43	29	6.38	6.97
Wisconsin	68	65	101	2.06	2.10
REGIONAL TOTAL & WEIGHTED AVG.[c]	363	284	419	3.00	3.30
REGIONAL INDEX CHANGE					+10.00%
RANGEWIDE TOTAL & WEIGHTED AVG.[c]	784	667	908	2.75	2.93
RANGEWIDE INDEX CHANGE					+6.55%

[a]Survey forms received after deadline for this report will be included in a later update.

[b]Includes routes carried as constant zero routes.

[c]Weighted averages are sums of products of woodcock heard per comparable route and the corresponding State or Province percentage of the total land area sampled. States or Provinces excluded where one comparable route represents more than 2,000 square miles or where the 2-year average is less than 0.5 birds per route.

Table 17. Computation of woodcock singing-ground survey weighting factors.

Survey area[a]	Land area[b] (Sq. mi.)	Comparable routes	Sq.mi.per comp. rt.	Weighting factor Regional	Weighting factor Rangewide
ATLANTIC REGION					
Connecticut	4,870	9	541	.0202	.0099
Delaware	1,982	3	661	.0083	.0041
Maine	30,933	46	658	.1289	.0633
Massachusetts	7,833	17	461	.0327	.0160
New Brunswick	27,835	41	679	.1160	.0570
New Hampshire	9,033	13	695	.0377	.0185
New Jersey	7,532	16	471	.0314	.0155
New York	47,869	73	656	.1995	.0982
Nova Scotia	20,402	35	583	.0850	.0418
Pennsylvania	45,025	67	672	.1877	.0923
Prince Edward Island	2,184	9	243	.0091	.0044
Rhode Island	1,049	4	262	.0044	.0021
Vermont	9,274	14	662	.0386	.0190
West Virginia	24,084	47	512	.1003	.0493
REGIONAL TOTAL	239,905	394	609	.9998	
CENTRAL REGION					
Michigan	56,818	94	604	.2291	.1165
Minnesota[c]	46,503	51	912	.1875	.0953
Ohio	41,018	73	562	.1653	.0840
Ontario[c]	49,220	29	1,697	.1984	.1008
Wisconsin	54,464	101	539	.2196	.1117
REGIONAL TOTAL	248,023	348	713	1.0000	
RANGEWIDE TOTAL	487,928	742	658		.9997

[a]Excluding States and Provinces where each comparable route represents more than 2,000 square miles or where fewer than 0.5 birds are heard per route.

[b]Land area only (inland water excluded) as listed in 1970 Commercial Atlas and Marketing Guide - Rand-McNally & Co.

[c]Excluding sections of Minnesota and Ontario outside of survey area.

Table 18. Woodcock banding by States, 1962-73 (excluding experimental birds).

LOCATION	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	12-YR TOTAL
ATLANTIC REGION													
Conn.			1				1	2	22	23	22	17	88
Fla.	1							4			1	1	7
Ga.			1		1			4					6
Maine	263	515	457	301	471	549	732	828	866	1,244	1,593	1,415	9,234
Md. & D.C.	6	22	12	16	13	7	5	2	4	9	14	123	233
Mass.	5	1	5	1	8	121		4	31	166	208	165	715
N.B.			17	5				261	191	263	191	169	1,097
N.H.						4	5			1		5	15
N.J.	6	13	12	7	13	4	645	345	556	452	287	290	2,630
N.Y.	9	15	20	9	19	8	14	485	479	762	741	573	3,134
N.C.	1						3		1				5
N.S.			34				1		7	1			43
Pa.	45	51	9	6	9	5	36	38	69	54	53	89	464
P.E.I.					1								1
Que.									1		63	7	71
R.I.		2			6	2	7	9	6		4	2	38
S.C.		1		1	1	1		1		4	1		10
Vt.									1	3	1		5
Va.	1						3	7	2		1	1	15
W. Va.		8	16	103	301	434	516	249	291	207	180	90	2,395
REGIONAL TOTAL	337	628	584	449	843	1,135	1,968	2,239	2,527	3,189	3,360	2,947	20,206
CENTRAL REGION													
Ala.			2	2			2	2	1	1	9	41	60
Ill.		2		1	2	2	3	4		9	2	8	33
Ind.	1	1	5	8				76	69	17		1	178
Iowa	2	3	1	5	3	2			3		2		21
La.	748	292	2,549	815	1,230	900	1,076	472	521	329	169	69	9,170
Mich.	50	124	79	355	365	396	868	403	397	472	315	374	4,198
Minn.	1	13	4	3		17	79	111	58	63	86	238	673
Miss.	1							146	132	98			377
Ohio		6	8		6	6	1	3	12	16	9	9	76
Okla.		1										4	5
Ont.	12	10	20	41	14	22	19	26	9	19	18	59	269
Tenn.		1	1	1		1	3		1			1	9
Tex.								1					1
Wis.	9	19	31	20	27	22	281	185	473	599	1,037	1,719	4,422
REGIONAL TOTAL	824	472	2,700	1,251	1,647	1,368	2,332	1,429	1,676	1,623	1,647	2,523	19,492
COMB. TOTAL	1,161	1,100	3,284	1,700	2,490	2,503	4,300	3,668	4,203	4,812	5,007	5,470	39,698

Table 19.--Summary of woodcock band recovery file through November 4, 1974 (excluding previously banded birds retrapped and released in same 10-minute block where originally banded).

State or Province of Recovery	State or Province of Banding																														Region Total	Range Total
	ATLANTIC REGION															CENTRAL REGION																
	Conn.	Maine	Md.	Mass.	N.B.	N.H.	N.J.	N.Y.	N.S.	Pa.	Que.	R.I.	Vt.	W.Va.	Region Total	Ala.	Ind.	La.	Mich.	Minn.	Miss.	Ohio	Okla.	Ont.	Wis.	Region Total	Range Total						
ATLANTIC REG.																																
Conn.	7	22		1	3		5			1			1		40			2							2	42						
Del.		2			1		2								5												5					
Fla.		6		1	1			2							10												10					
Ga.		12	1	2		1		3						2	21			2	4					2		8	29					
Maine		380		3	5		3			2				1	394			9								9	403					
Md.		5	2												7												7					
Mass.	1	21		57	1		2							1	83			6	1							7	90					
N.B.		14	1		57		1								73			1								1	74					
N.H.		13		3	1	1	1	1						1	21		1	8								9	30					
N.J.		39		4	8	1	108	8							168			3								3	171					
N.Y.	1	22	1	3	2		5	97		1				5	137			21			1	1		1		24	161					
N.C.		17		2	1		9	5		2				3	39			1	1							2	41					
N.S.									9						9	1		7								8	17					
Pa.		34	1	5	5		9	11		52	1	1		4	123			28	1					1		30	153					
Que.		1	1				1	3			1			1	8			2								2	10					
R.I.		1													1												1					
S.C.		16	1	2			1	3		1				40	64			2								2	66					
Vt.		1		1				1							3			3								3	6					
Va.		15		5	1		6	4						3	34												34					
W. Va.					1			1			1			426	429			3								3	432					
Subtotal	9	621	8	89	87	3	153	139	9	59	3	1	1	487	1,669	1	1	98	7		1	1		4		113	1,782					
CENTRAL REG.																																
Ala.		2					1	4						2	9			16	5		3			2	1	27	36					
Ark.		1												1	2			20		1				1	8	30	32					
Ill.																		6							2	8	8					
Ind.		1													1		3	7	1							11	12					
Iowa																		3							1	4	4					
Ky.		1													1			9	1		1				1	12	13					
La.		9		1	3			3						5	21		1	184	16	1	1			1	13	217	238					
Mich.																1	1	123	372		2	1			3	503	503					
Minn.																		14		13					1	28	28					
Miss.		3		1			1	1		1				5	12		1	43	6	1	1				5	57	69					
Mo.																		7	1	2						10	10					
Ohio		1					1	1		1					4			12				3				15	19					
Okla.																							1		2	3	3					
Ont.		1					1	1						1	4			19	1		1			7		28	32					
Tenn.		3						1						1	5			5	1					1	1	8	13					
Tex.		2													2			2	1						5	8	10					
Wis.																		57		1	2				78	138	138					
Subtotal		24		2	3		4	11		2				15	61	1	6	527	405	19	11	4	1	12	121	1,107	1,168					
Total	9	645	8	91	90	3	157	150	9	61	3	1	1	502	1,730	2	7	625	412	19	12	5	1	16	121	1,220	2,950					

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